Abstract

The paper describes the use of smart multibeam antenna or multiple antennas with a smart modem that uses A packet based protocol . Smart antennas are multi narrow beam antennas in one antenna housing shown in Fig. AM.1 and Fig. AM.2.

Description

The modem network uses a packet protocol, in which there is a field in the packet that tells the modem which antenna or which antenna beam to use . If the information in such field indicates a routed packet as well as a particular antenna identification number or in modems using smart antennas it will be a beam identification . Fig. AM.3 shows the BTS communicating over beam #1 to house A or building A and as the modem in house A or building A looks at a field in the packet, it will know t route to house B or building B using beam #8 of the smart antenna. This establishes a routed beam in space versus a beam that covers all directions, making the system more resilient . It will also make the system cause less interference to other systems. Fig. AM.4 shows a house or building E communicating with BTS, and based on a fields in the packet, the modem will determine whether to use antenna #1 or antenna #2 to route the packets. Antenna #1 and antenna #2 could be directional antennas or a combination of directional as well as omnidirectional.

Claims

To further define the use of multiple antennas or a multibeam antenna in a modem ,
Base station network we claim:

1. A packet protocol based wireless network where there is modems and a base station Exchanging packets in a known packet format where there is a field that identifies:

    a. An antenna number where the packet is receieved on and an antenna number Where the packet is retransmitted on at the receiveing modem.

    b. In a multibeam antenna a configuration field shall describe the beam number Where the packet is received on and a beam number where the packet is transmitted on.

The beam numbers or the antenna numbers are not necessarley the same , and
They can be same if needed.

2. In a configuration where a modem has a multibeam antenna or multiple
    Antennas , the modem will search for a base station reception by scanning
    Through the multibeams or the different antennas connect to it until it
    Finds a base station further eliminating human intervention to adjust the
    Direction of the antennas.

**Abstract:** The paper describes the use of Smart Antenna's with the Cellular IP Modem network. Smart Antennas are multi narrow beam antennas in one antenna housing. shown in Fig AM.1 and Fig AM.2

Description: The cellular IP modem network uses the cellular IP Packet protocol, in which there are the Fields status and type defined in the Packet description. IF the information in those Fields indicate a routed Packet as well as a Prticular antena Identification number or in Modems using Smart antenna's it will be a beam identification number.

Fig AM3 shows the BTS communicatig over beam #1 to house A or bldg A and as the modem in house A or bldg A looks at status or type fields it will know to Route to house B or bldg B using beam #8 of the smart Antenna. This establishes a routed beam in space versus a beam that covers all directions making the system more resiliant to interferance. It will also make the sytem cause less interferance to other systems. Fig AM4 shows a house or bldg E communicatig with BTS and based on status and type fields the modem will determine
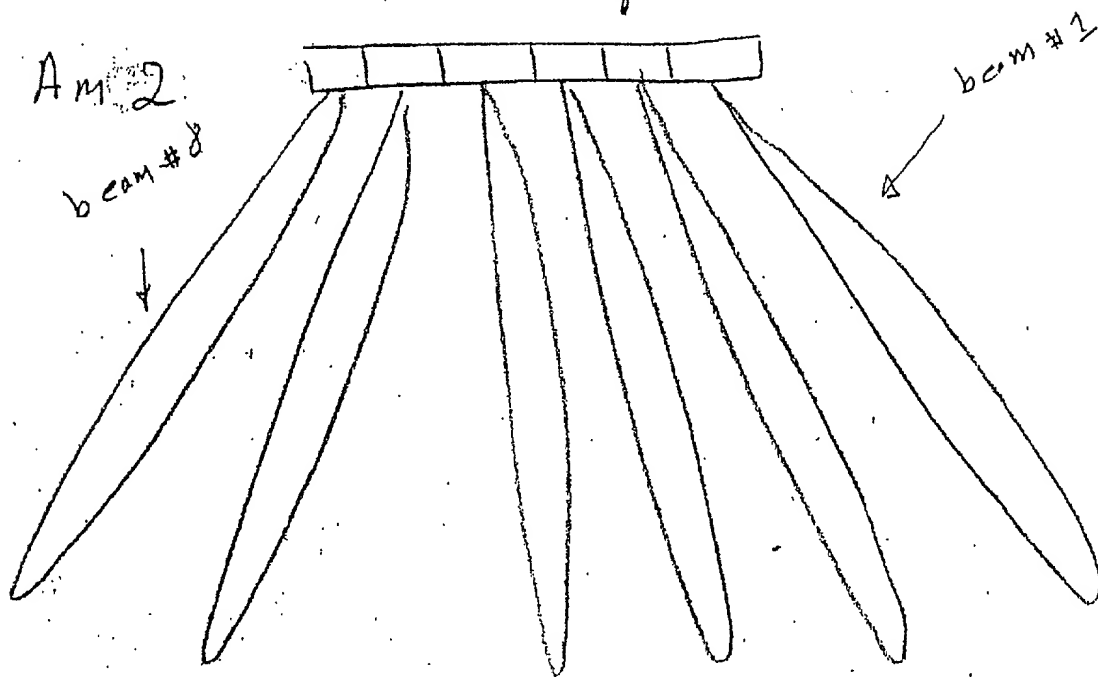
beam #8 . . . . . beam #1

Fig Am 1 →
Front view
of Antenna
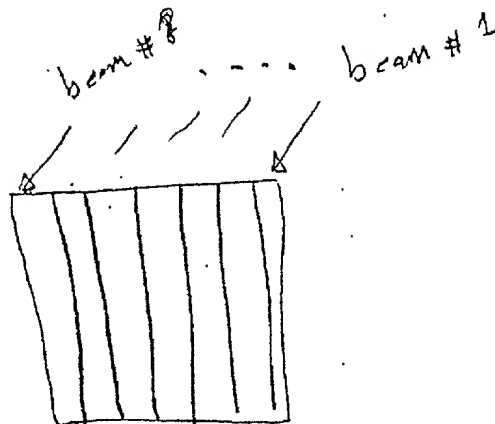
multi antenna elements
Antenna   " smart antenna"

Top view of Antenna

Fig Am 2

beam #1

beam #8

multi beam pattern
of multi elements Antenna

beam # 1

BTS

beam # 8
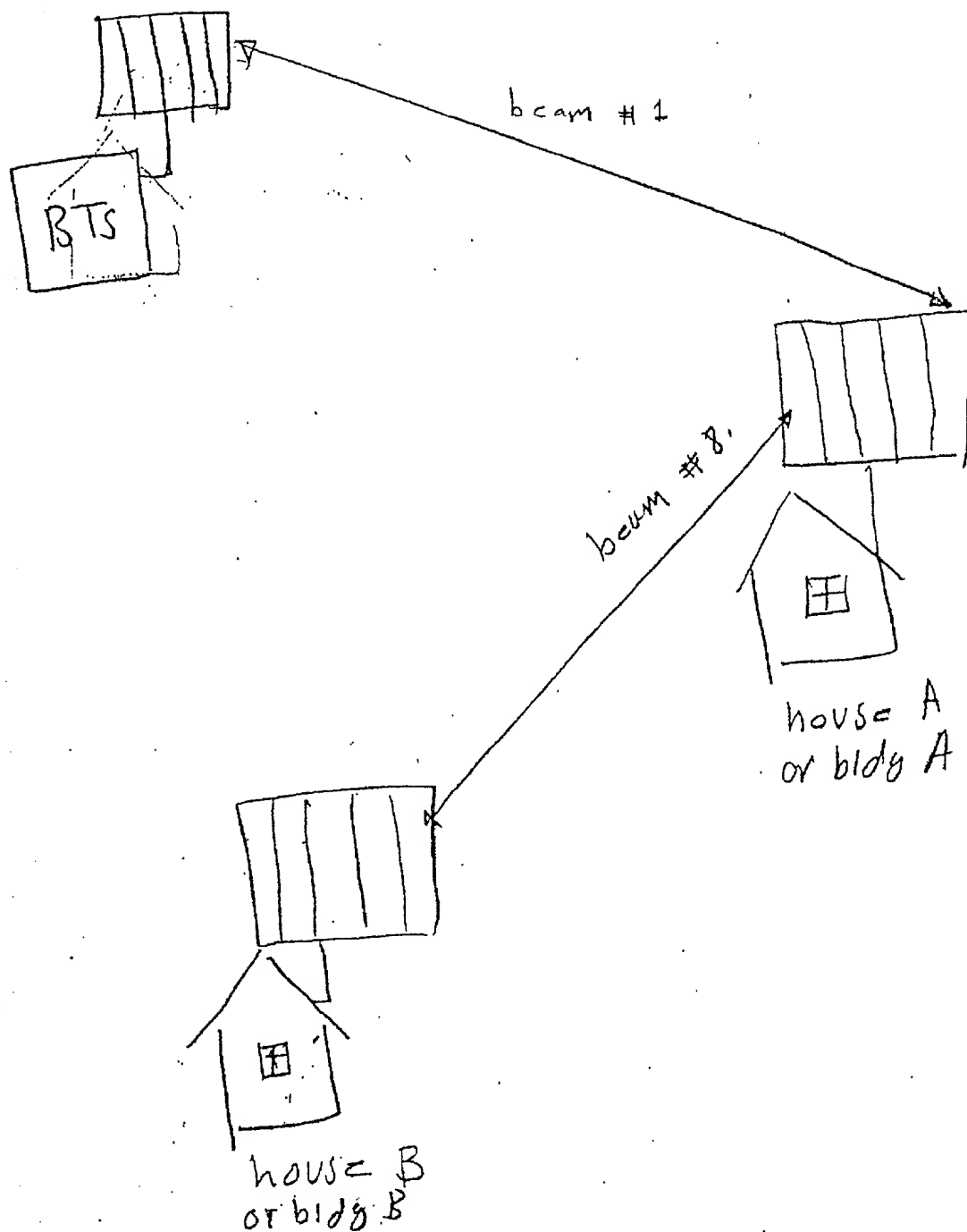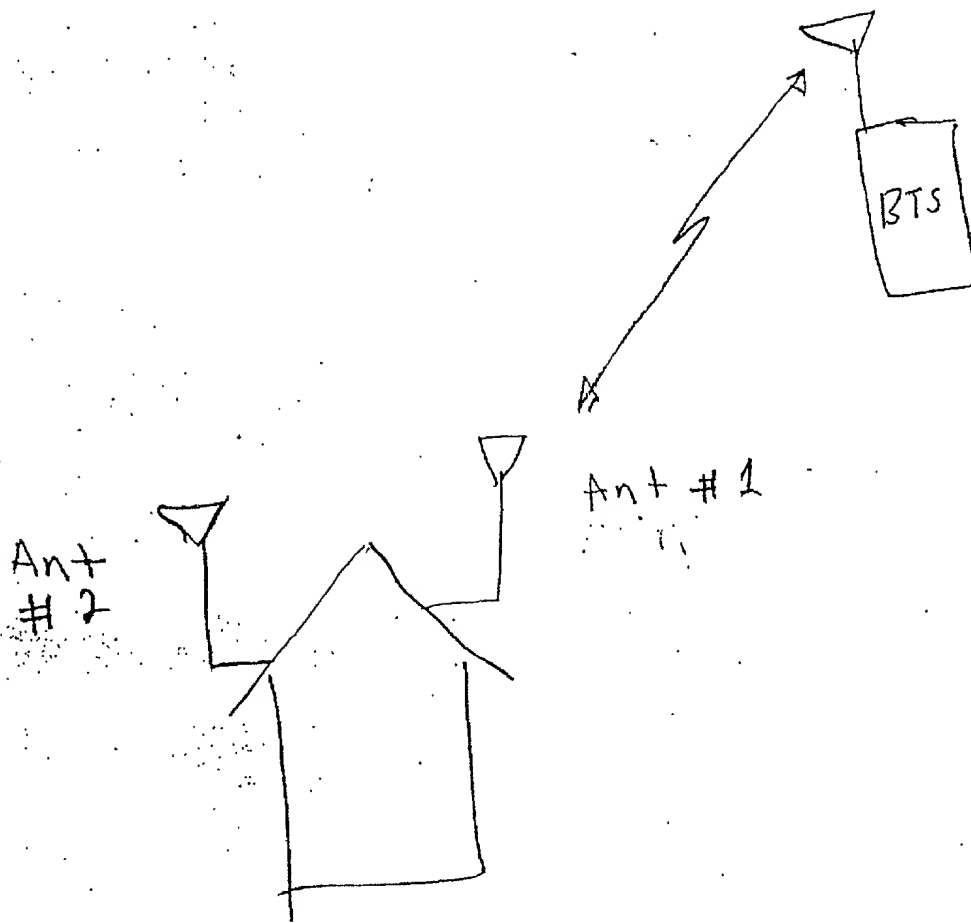
house A
or bldg A

house B
or bldg B

Fig A.M. 3   Cellular IP cell
Using "Smart
Antennas"

BTS

Ant #1

Ant #2

house
or bldg E

Fig Am 4

Whether to use Ant #1 or Ant #2 to route the cellular IP packets. Ant #1 and Ant #2 could be directional Antenna's or a combination of directional as well as omni directional.

Claims: To Further define the Function of the status and type Fields of the cellular IP Protocol by extending the support of multiple Antenna as shown in Fig AM 4 or by using Smart Antennas as show in Fig AM 1, AM2 and AM3.